

IN THE SPECIFICATION

Please amend the specification as follows:

Page 26, Lines 21-26, through Page 27, Lines 1-15:

--The first object can be achieved by ~~the~~ a virtual machine of Claim 1.

~~According to Claim 1, the~~ The virtual machine executes a virtual machine instruction sequence under control of a real machine, the virtual machine comprising: a stack unit for temporarily storing data in a last-in first-out format; an instruction storing unit for storing the virtual machine instruction sequence and a plurality of sets of succeeding instruction information, wherein each virtual machine instruction in the virtual machine instruction sequence is associated with a set of succeeding instruction information that indicates a change in a storage state of the data in the stack unit due to execution of a virtual machine instruction executed after the associated virtual machine instruction; a read unit for reading a virtual machine instruction and an associated set of succeeding instruction information from the instruction storing unit; and a decoding-executing unit for specifying and executing operations corresponding to a combination of the read virtual machine instruction and the read set of succeeding instruction information.--

Page 31, Lines 11-26, through Page 32, Lines 1-2:

--The ~~first~~ first object can be also achieved by ~~the~~ a virtual machine compiler of Claim 7.
~~According to Claim 7, the~~ The compiler generates programs for a virtual machine with a stack architecture that includes a stack, the compiler including: an instruction sequence converting unit for converting a source program into a virtual machine instruction sequence executable by the virtual machine; a succeeding instruction information generating unit for generating sets of

succeeding instruction information corresponding to virtual machine instructions in the virtual machine instruction sequence, each set of succeeding instruction information indicating a change in a storage state of data in the stack due to execution of a virtual machine instruction executed immediately after a virtual machine instruction corresponding to the set of succeeding instruction information; and an associating unit for associating each set of generated succeeding instruction information with a corresponding virtual machine instruction and outputting the set of succeeding instruction information and the virtual machine instruction.--

Page 32, Lines 10-26, through Page 33, Line 1:

--The second object can be achieved by ~~the a virtual machine of Claim 8.~~ According to ~~Claim 8 the~~ The virtual machine executes a virtual machine instruction sequence under control of a real machine, the virtual machine including: an instruction storing unit for storing the virtual machine instruction sequence; a read unit for reading a virtual machine instruction in the virtual machine instruction sequence from the instruction storing unit; and a decoding-executing unit for specifying and executing operations corresponding to the virtual machine instruction, wherein the decoding-executing unit includes a branch instruction judging unit for judging if the virtual machine instruction is a branch instruction and an interrupt handling unit for detecting, if the virtual machine instruction is judged to be a branch instruction, whether there is an interrupt request, and, if so, performing a corresponding interrupt handling in addition to executing the branch instruction.--

Page 34, Lines 1-21:

--The second object can be also achieved by ~~the a virtual machine of Claim 10.~~ According to ~~Claim 10, the~~ The virtual machine executes a virtual machine instruction sequence

under control of a real machine, the virtual machine including: an instruction storing unit for storing the virtual machine instruction sequence; a read unit for reading a virtual machine instruction in the virtual machine instruction sequence from the instruction storing unit; and a decoding-executing unit for specifying and executing operations corresponding to the read virtual machine instruction, wherein the decoding-executing unit includes a block judging unit for judging if the read virtual machine instruction is a virtual machine instruction representative of a block, a block being a predetermined number of virtual machine instructions and an interrupt handling unit for detecting, if the read virtual machine instruction is judged to be the representative virtual machine instruction, whether there is an interrupt request to the virtual machine, and if so, performing a corresponding interrupt handling in addition to executing the representative virtual machine instruction.--

Page 36, Lines 2-24:

--The third object may be achieved by ~~the a virtual machine of Claim 12.~~ According to Claim 12, ~~the~~ The virtual machine executes a virtual machine instruction sequence under control of a real machine, the virtual machine including: a real machine program storing unit for storing a plurality of subprograms composed of real machine instructions; an instruction storing unit that includes a first area for storing the virtual machine instruction sequence and a second area for storing a plurality of pointers to the subprograms in the real machine program storing unit; a read unit for reading a virtual machine instruction in the virtual machine instruction sequence from the first area in the instruction storing unit; and a decoding-executing unit for specifying and executing operations corresponding to the read virtual machine instruction, wherein the decoding-executing unit includes an area judging unit for judging whether the virtual machine

instruction is an instruction that transfers control flow to a location in the second area and an address converting-executing unit for executing, if the virtual machine instruction is judged to be an instruction that transfers control flow to a location in the second area, a subprogram indicated by a pointer stored in the location.--

Page 37, Lines 22-26, through Page 38, Lines 1-24:

--The fourth object can be also achieved by ~~the~~ a virtual machine ~~of Claim 14~~. According to ~~Claim 14~~, the The virtual machine executes a virtual machine instruction sequence under control of a real machine, the virtual machine including: an instruction storing unit for storing the virtual machine instruction sequence; a read unit for reading a virtual machine instruction in the virtual machine instruction sequence from the instruction storing unit; and a decoding-executing unit for specifying and executing operations corresponding to the read virtual machine instruction, wherein the instruction storing unit is a plurality of instruction blocks that constitute the virtual machine instruction sequence, the instruction blocks corresponding to basic blocks, wherein the instruction blocks each include: an identifier area for storing an identifier that specifies a start position of the instruction block in the instruction storing unit; a non-branch instruction area for storing non-branch instructions belonging to a corresponding basic block; and a branch instruction area for storing at least one branch instruction belonging to the corresponding basic block, wherein each branch instruction stored in the branch instruction area designates a branch destination using an identifier stored in one of the identifier areas, and wherein if the read virtual machine instruction is a branch instruction, the decoding-executing unit has control flow branch to a start position of a non-branch instruction

area in an instruction block having an identifier designated by the branch instruction as a branch destination.--

Page 41, Lines 7-15:

--With this construction of the virtual machine, in addition to the effects achieved in the virtual machine of ~~Claim 15~~ that manages a virtual machine program in units of instruction blocks, a time to decode a virtual machine instruction is shortened for the instruction blocks that already have a decoded data sequence. This is because the decoded data sequence is executed directly instead of virtual machine instructions. As a result, the execution speed of the virtual machine is improved.--

Page 43, Lines 5-26, through Page 44, Lines 1-12:

--The fifth object can be achieved by ~~the a virtual machine of Claim 19. According to Claim 19, the~~ The virtual machine executes a virtual machine instruction sequence under control of a real machine, the virtual machine including: an instruction storing unit for storing a compressed virtual machine instruction sequence to be executed; a read unit for reading a compressed virtual machine instruction in the compressed virtual machine instruction sequence from the instruction storing unit and decompressing the compressed virtual machine instruction to generate a decompressed virtual machine instruction; and a decoding-executing unit for specifying and executing operations corresponding to the decompressed virtual machine instruction, wherein the instruction storing unit is a plurality of instruction blocks containing compressed virtual machine instructions constituting the compressed virtual machine instruction sequence, the instruction blocks corresponding to basic blocks, wherein the instruction blocks each include: an identifier area for storing an identifier that specifies a start position of the

instruction block in the instruction storing unit; a non-branch instruction area for storing compressed non-branch instructions belonging to a corresponding basic block; and a branch instruction area for storing at least one compressed branch instruction belonging to the corresponding basic block, wherein each compressed branch instruction stored in a branch instruction area designates a branch destination using an identifier stored in one of the identifier areas, and wherein if the decompressed virtual machine instruction is a branch instruction, the decoding-executing unit has control flow branch to a start position of a non-branch instruction area in an instruction block having an identifier designated by the branch instruction as a branch destination.--

Page 45, Lines 13-26, through Page 46, Lines 1-20:

--The sixth object can be achieved by the JIT compilers of Claims 25 and 26. According to Claim 25, the The JIT compiler is for use with a virtual machine that executes a virtual machine instruction sequence under control of a real machine, the JIT compiler converting parts of the virtual machine instruction sequence into real machine instruction sequences before execution, the JIT compiler including: a block start information receiving unit for receiving an input of block start information for each virtual machine instruction that composes the virtual machine instruction sequence, the block start information showing whether a corresponding virtual machine instruction would correspond to a start of a basic block if the virtual machine instruction sequence were divided into basic blocks; a converting unit for converting virtual machine instructions in the virtual machine instruction sequence into real machine instruction sequences; and an outputting unit for rearranging the real machine instruction sequences produced by the converting unit into basic block units in accordance with the block start

information received by the block start information receiving unit. Here, this JIT compiler may further include a branch violation judging unit for judging, when a real machine instruction at a start of a produced real machine instruction sequence corresponds to a virtual machine instruction whose block start information indicates that the virtual machine instruction would be a start of a basic block, whether the real machine instruction is going to be arranged in an address that violates an address alignment restriction of the real machine, wherein if the real machine instruction is going to be arranged in an address that violates the address alignment restriction, the outputting unit may rearrange the real machine instruction sequence so that the real machine instruction is not arranged in the address.--